Review about junior program operational safety and training at JSA of LIS member programs:

The Junior Sailing Association of Long Island Sound (JSA) believes that the training of instructors and waterfront staff is of primary importance for all junior sailing programs. JSA and its member clubs have taken a close look at safety protocols and training practices. We recognize that each club has different equipment, boats, etc, and has different uses and needs. On JSA's website are various resources dealing with safety and the management of risk at sailing programs. These links are provided to encourage informative discussions of some of the options available, including to what extent and under what circumstances are prop guards part of the safety planning and risk management junior programs.

Prior to summer 2018, the JSA conducted a survey that asked its member sailing programs about their overall safety training and operational practices, and plans for enhancement. Questions included:
- What kinds of safety policies, checklists and emergency plans are in place?
- What actions were taken to review or improve safety during the summer?
- What enhancements are being planned for next summer?
- What type of certification/training is required or provided for sailing instructors who operate powerboats?
- Are propeller guards being used, and if so what influenced that choice?

Following the summer of 2018, the survey was updated with additional replies from JSA member programs about specific efforts to enhance the safe operation of powerboats. The updated survey results are summarized below.

What is your program's experience with propeller guards?

Twenty seven clubs responded to the question about usage of guards for the propeller of outboard motors during 2018. The various types of guards in use are summarized here (some clubs tested multiple types so the total in the table is over 27):

Guard type \ Satisfaction level	N/A	Less Satisfied	Satisfied	Very Satisfied	Count
Polypropylene rings (POLY)		4	3	3	10
Wire cage (CAGE)		4	2	1	7
Stainless steel band (STEEL)			1	2	3
Unknown guard type (UNK)		3			3
Other propeller safety methods:					
No guards in 2018 (NONE)	5				5
Jet pump outboard (JET)			1	2	3
Aegis propeller design (AEG)				1	1
Total Count	**5**	**11**	**7**	**9**	**32**

- **Polypropylene concentric ring** from Prop Guard Marine Inc (http://propguardmarine.com)

Used by ten clubs. It had a wide variation of satisfaction, from less-satisfied to very-satisfied. Some clubs reported that the polypropylene guards broke easily. Other clubs were very satisfied, particularly if they had received support from the manufacturer while the club was installing the guards on their engines.

-**Wire cage swimmer guard** from Propeller Guard Technologies (http://www.propguardtech.com/swimguard.html)

Used by eight clubs. Satisfaction ranged from less-satisfied to very-satisfied. Less-satisfied users disliked how the full-coverage wire cage design caused drag that reduced maximum boat speed. But

the satisfied users liked the extra protection provided by the full-coverage cage surrounding the propeller. One club purchased a model with a partial wire cage, which seemed to minimize the adverse effect on boat speed.

-Stainless steel band
Two styles are manufactured by Adventure Marine Manufacturing
(https://adventuremarine.ca/product/propeller-line-guard)
As manufactured by Prop Savers Inc.
(http://propsavers.com/troll-prop-saver)
Used by three clubs. The clubs reported they were satisfied to very satisfied with the metal band style, which reportedly had little effect on the speed of the boat.

-**Unknown prop guard** type was reported by three clubs, all of which were less-satisfied.

Other methods of addressing propeller safety were reported:
-No Guards installed was the response from five clubs. Each had various reasons for not installing during 2018, but each clubs with no guards reported that special emphasis was given towards extra training and monitoring of safe powerboat operating procedures at their club.

-Jet pump outboard was tested by three clubs, two of which seemed very satisfied with a unit installed for a few months during 2018. The jet drive pump impeller is protected from injurious contact because it's enclosed within the underwater housing.

- The *Aegis* brand propeller design with rounded edges is available from Turning Point Propellers (https://turningpointpropellers.com). This prop is claimed to reduce the occurrences of incidental contact injury by persons in the water when the boat is at idle or stopped. One club tested this propeller and reported the operating performance of the boat was not degraded.

What type of certification or training does your program require or provide for its sailing instructors who operate powerboats?

All the clubs require the Safe Powerboat Handling certification for new instructors, and many clubs are now requiring SPH certificates for all of their on-water staff, regardless of experience. And some of the clubs have started to provide on-site training and assessment by their for the powerboat skills of their instructors, including the Safety and Rescue Boat Handling course. Some clubs changed the focus of activities for their staff during the week prior to the start of the summer program from setup of equipment to training in safe operation of powerboats.

What other actions did your program take to review or improve safety during the summer?

During the week prior to the start of the summer program, most of the clubs reviewd their emergency action plan and on-water safety procedures. Some clubs conducted capsize recovery and injured-sailor drills, and invited local first responders to participate. A few clubs have started drug and alcohol testing. Clubs also trained staff to operate boat hoists safely.

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Examples of responses > is from 2017 >> is from 2018	**Type Guard** see code on Page 5	**Satisfaction with Guard**	**Type Boats**	**Type Engines**	**Action for 2019**
>The decision to add the prop guards to all Jr Sailing coach boats was based on the recommendation in 2012 of our Club Manager and Jr Sailing Committee, and was approved by the Board of Governors. The guards are a stainless steel band style supplied by Adventure Marine Mfg. While the guards seem to protect well from lines or other things brushing past the propeller, we don't think they are fool-proof. The only way to insure that all sailors are safe is to keep sailors away from any engine that is running. The coach boats with guards include RIBs and Whalers of various lengths. The prop guards have not been installed on the boats dedicated to the race committee, because they are not used for for the junior program. >>The guards have been used since 2012. They have been very reliable, with some in service for seven years.	STEEL-A	Very Satisfied	RIB BW		Same
>A few years ago we installed a plastic ring type propeller guards on RIBs with a 50 hp and 90 hp outboard engines. In just a few short weeks both were destroyed: the 50 hp was damaged by coaches hitting things; the 90 hp prop guard appeared to have a manufacturing fault. Since we could not justify the cost of replacing them several times a season they were never reinstalled.	No update				
>We are considering installation of prop guards on all powerboats used for junior sailing. We are currently researching different products, the necessity of increasing engine horsepower, and deciding whether to install them on both the whalers and the RIBs, or just one of those two types of powerboats. We intend to do tests about effect on speed because we have doubles of the same boat types. After the testing we decided to use the Prop Guard Marine brand. The RC boats are also because the club members who drive these boats have less day to day operation and rescue experience than do the certified sailing instructors . We will be conducting our own certification that includes 10 hours of driving boats before our program starts. >>We are very excited with our Prop Guards. We installed 14 guards in total on our junior coach boats and our ddult program race committee boats . Now, it's really hard to tell the difference after we worked with the manufacturer and had some props reshaped. Our kids, parents and instructors are all feeling that we added a level of safety that will help everyone.	POLY	Very Satisfied	RIB BW		Same
>We have not used prop guards in the past, due to some testing by American Boating and Yacht Council that appeared to indicate across all conditions that they are more dangerous on average, (see sample ABYC report). But in response to the accident, and in anticipation that a policy may be created by the state or by the JSA LIS, we expect to install plastic concentric-ring guards on all junior program dedicated boats in 2018. We have 15 ft RIBCRAFT and 17 ft Whalers. >>We installed Prop Guard brand guards on all junior instruction boats, which are 15' RIBCRAFT and 17' Whalers, all with 50HP Yamaha motors. No issues, happy with product. Increased cavitation at speed and decreased top speed (aprox. 5-10%). Long term impact on the outboards is yet to be assessed.	POLY	Satisfied	RIB BW	YAM50	Same
>Experience with the full cage swim guards included two week testing at the end of the summer 2017 in which we found overall speed was the only compromise in performance. We decided that speed is not an issue as we operate almost 100% in a no wake zone. The guards will be installed on Yamaha 50 hp motors on Boston Whaler 17 foot boats. However, our travel boats will likely not have prop guards on them. >>We installed them on all our coach boats and were very happy with their performance. We also installed them on our travel boats, but are now looking into a quicker on/off modification for the travel boats using aircraft pins.	CAGE	Very Satisfied	BW	Yam50	Devise quick removal/reinstall method for the guards on boats that travel long distances at higher speed.

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Examples of responses > is from 2017 >> is from 2018	**Type Guard** see code on Page 5	**Satisfaction with Guard**	**Type Boats**	**Type Engines**	**Action for 2019**
>We have done a fair amount of research. We have one type of guard now installed, but results are inconclusive. The guards cause damage to propellers when hitting an obstruction, but fortunately there have been no propeller strikes to people. We will be trying the Turning Point "Aegis" safer propeller on some boats when they need replacement propellers; it is designed to minimize flesh injury from a prop strike. >>The Aegis prop performed beautifully. We don't keep data on fuel performance but the boat performed and handled very well. After a full season of use the propeller is in good condition and has retained its shape without getting dinged up. We have a prop guard on one of our boats (stainless steel ring type). We have also purchased a number of different types including the plastic concentric ring type, and the swim cage type. These did not fit properly on the engine so we have continued to search for a better solution. After the summer, we installed a jet drive on one of the coach boats, and the preliminary tests are very positive. So if the unit performs well in service next summer, I think that is the direction our club may take. Note: We weren't able to find any volunteers to stick their arm in the safer propeller to verify the safty aspect. I suppose the same could be said of verifying a prop guard's safety. So who is to say that a prop guard is any more effective than the safer propeller in preventing serious injury? Something that is not generally asked is, if indeed the prop guards are effective why are there no OEM prop guards? We do know the damage prop guards can do to the lower unit without any evidence of efficacy. If there were any OEM prop guards we would most likely try those.	AEG JET CAGE POLY	Very Satisfied Satisfied Unsatisfied Unsatisfied			Continue testing of jet drive engines
>We have not selected a prop guard. We have had mixed results with the ones that we have tested. We tested on the 4.8 ribs and 15 foot whalers. No official plan yet, although club management does intend to install guards for 2018 season. >>We used the blue Prop Guard brand model. Our team got better at installing them but did noticed that the guards are not all the same. Installers, at times, had to bend and make adjustments. We have the guards on the vast majority of boats used for junior sailing activities. However, the guards change the characteristics of the engine and many of the guards broke during use.	POLY	Unsatisfied	RIB BW		Review other options
>No past experience, but after the accident, the club board required that prop guards be added to on all coach boats 2018. >>We tested the full cage swim guard and found that it did hinder high speed performance, but not low speed maneuvering. We have full cage on coach boats used locally, especially those used to coach beginners (i.e. opti sailors). We installed a partitial cage version (the SwimGuard–Pro model) with screening only on the sides and front with an open back. This did not hinder performance. Used on Boston Whaler with 40 HP engine.	CAGE	Satisfied	BW	40HP	Same
>We have evaluated several types. Because our engines are low power (relative to many junior sailing support boats) we have had difficulties finding guards that will not reduce power to the extent that we cannot get the Whalers to plane. We have narrowed it down to two types and will be installing prop guards on all small outboards prior to the commencement of the 2018 program. >>We tried the swim cage and it reduced power by over 40%. We are also trying a concentric ring style, which will be tested on a 13ft whaler with a 15hp Mercury and see how much the of the propellers power is left with this guard. We are looking into buying a bigger motor but waiting to see how the performance on the 15hp will be. The next move is up to a 25-30hp, which we would like to avoid buying. We also tested a Yamaha 30 HP jet drive, and liked it very much.	CAGE JET	Unsatisfied Very Satisfied		Merc15	Consider use of jet drive engines
>We have no experience with propeller guards, but have inquired about them.	No update				
>No current experience with prop guards, but will be adding them to coach boats this summer.	No update				

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Examples of responses > is from 2017 >> is from 2018	**Type Guard** see code on Page 5	**Satisfaction with Guard**	**Type Boats**	**Type Engines**	**Action for 2019**
>We have no experience with prop guards as of yet; we tested a series of guards. This past winter and this spring, we will be installing prop guards on all of our coach boats. Our testing experience was that there is a noticeable decrease in top-end speed and acceleration, but minimal impact to low- and mid-range speed and maneuverability. While we do not have actual experience yet -- that will come this summer -- we do not expect that prop guards will have a negative impact on our coach boat fleet. We would be in a position to report actual use at the end of the summer. Our coach boats include whalers and RIBs with Yamaha engines between 25 and 75 HP. All these boats will have a stainless steel full cage swimmer guard from Prop Guard Technologies installed. >>We realize that more horsepower will be needed to overcome the draf of the full cage swimmer guards. But even with more HP, travelling long distances with the guard in place was too slow. So we have started to deliver the coach boats to regattas by use of a road trailer.	CAGE	Satisfied	RIB BW	YAM25 YAM75	
>>We used the full cage swim guards that we ordered through Propeller Guard Technologies, Inc. We had to return two of them only a week into the program because the welding was separating and the guards fell apart. The company replaced the guards because they felt the welder was new on the job and had not done good work. But even with the new guards the boat performance was awful and the guards did not hold up well. I would say I am not happy with this product. It had a big impact on the performance of the boats. I would say we lost about 40% speed on all our boats.	CAGE	Very unsatisfied			Review other options
>We have not implemented prop-guards in the past, though we are considering the possibility for 2018. Issues being weighed include may prop guards offer a false sense of security to instructors, and may decreased performance of powerboats with guards impede action in the event of an emergency. We are aware that some nearby clubs have put prop guards on their boats. Instead of guards, we have emphasized stringent training in our operational procedures, and skills testing.	NONE	Satisfied			Consider effect of Suffolk Cty law on need to install prop guards in 2019
>After news of the accident we purchased and installed aftermarket prop guards on two coach boats. It was late in the season, so more time is needed for conclusive results. Our plan is to keep them installed and possibly install on more boats this summer. We want to evaluate their benefits and performance. >>We currently have only two of our safety boats with prop guards installed. They are made of a thick plastic with concentric circles around the propeller. Because of the thickness of the plastic, they drastically disturb the water flow around the prop. The engine performance is very different, even operating at slow speeds. Working closely with the outboard mechanic, we are seeing a little more wear on the outboards. The engines that have guards installed are both Yamaha 4 strokes. One is 25 hp (13' Whaler) and the other is 60hp (16'RIB). We also have a 19'Mako 115 hp Yamaha with out a guard, but we didn't use that boat when teaching. We are continuing to explore other models of prop guards that might better suit our needs. I hope to install guards on ALL boats within the year.	POLY	Unsatisfied	RIB BW	Yam25 Yam60	Review other options

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>We had tested a full cage guard from Prop Guard Technology in California. But we found severe performance degredation. Tested in winter both with and without the front cage piece on a 50HP Yamaha. With the front in place, the motor dug so badly that above 2700 RPM, we had to stand up and strain to see over the bow. It had angled up something like 40 degrees. Removing the front screen improved performance, although not by a lot. We could run the RIB up to about 3200 RPM before it started digging. With the cage in place, the boat was almost unusable as a frostbite rescue boat. Instead, we have purchased concentric ring guards from Prop Guard Marine. Based on our previous experience with this style we anticipate few issues, although we have experienced breakage of these plastic guards in the past. We may need to re-size the props, based on the manufactuers recommendation, after performance testing following the installation. We have also purchased and will install Virtual Lifeline Electronic Cutoff Switch (ECS) technology from Prop Guard Technology. And we plan to test a jet drive lower unit that will be installed on one of our Yamaha 50s. >>We only used the Prop Guard brand with our coach boats, the jet drive adaptation never materialized for mostly technical issues. The installation of the prop guards is easy and very straight forward. All of coach boats were equipped and the overall feedback from the instructors was that even though performance was slightly affected it was mostly a matter of getting used to them. It did not affect the coach's job.	POLY CAGE	Satisfied Unsatisfied	RIB BW	YAM50	Consider use of jet drive engines
>We will have stainless steel prop guards on each coach boat, and plastic prop guards on our 13 ft whalers.	No update		RIB BW		
>>We put a new outboard jetdrive on an old 14 ft Ribcraft inflatable, and are very pleased with how it works. The biggest benefit is that not only you eliminate the propeller risk, but also the lower unit. The water intake only goes half an inch under the hull of the boat. Instructors were very satisfied with the jet drive after getting experience with it. The jet may be the way our club goes in 2019. We also tested a variety of propeller guards, including some from NZ. We finally selected the stainless steel band type from Adventure Marine, which worked very well. Specifically, it had very little effect on performance when the motor is reversed.	JET STEEL-A	Very Satisfied Very Satisfied	RIB		Consider use of jet drive engines on all boats
>Our club has used propellor guards for years now.	UNK				Same
>>We did not install guards in 2018. Instead of guards, we have emphasized stringent training in our operational procedures, and skills testing.	NONE				Review other options
>Our dock master will be putting on prop guards	No update				
>>Prop Guards were used again this year at our club. We have been using them for several years and they are effective. We did lose several prop guards, perhaps to bottom strikes by instructors, and those boats were taken out of service until the guards were replaced.	POLY	Very Satisfied			Same
>>We had a hard time finding prop guards that worked, and many not fit correctly. So we tried them, but are still looking. The guards also make the boats quite slow, too slow sometimes to drive to regattas by water.	UNK	Unsatisfied			Review other options
>>We installed prop guards at the end of the 2017 season. All four of our club boats have prop guards on them. The guards worked great and did not effect the vessels ability to perform. The guards were concentric rings from Prop Guard Marine. They are on three 40 horse boats and one 90 horse boat. These are all of the the club boats, even the 90 horse that isn't used regularly with the sailing program.	POLY	Very Satisfied	RIB BW	40 and 90	Same
>>We did not install guards in 2018. Instead of guards, we have emphasized stringent training in our operational procedures, and skills testing.	NONE				Review other options
>>I am not sure of the brand name of the prop guard that we tried out this summer on one RIB but we were not satisfied with it because it was bulky. We will switch to the Prop Guard brand for all the coach boats in 2019 because a nearby club has been very satisfied with them. However, when I questioned our dealer about the Prop Guard brand, I was told that another club had tried one that had broken within just one week. Maybe because they are dealing with shallow conditions?	UNK	Unsatisfied	RIB		Changing to the POLY style for 2019

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>>We have had a lot of difficulty installing safety guards on our outboards which was an issue. I will advise later the manufacturer/model number.	UNK	Unsatisfied			Review other options
>>We did not use prop guards or jet drive engines this year. My concerns regarding the prop guards being that a) the prop guard may give operators a false sense of security; and b) a loss of low-speed maneuverability. I would be interested to hear the feedback from other clubs regarding their experience if they implemented guards this year vs. last year.	NONE				Review other options
>>All 3 chase boats had the Mac's Troll Prop Saver installed, which is a SS band. Staff feedback was very positive. Our instructors claim the guard didn't cause any meaningful issues because they were driving mostly at low speeds.	STEEL-P	Satisfied			Same
>>We have used the Prop Guard brand for a few years. And for 2018 put the guards on all of our Yamaha 50hp engines. Installation is simple, just have to drill a few holes in the lower unit. We are seeing fewer damaged props, but we lose about 1/3 of the prop guards each year. It appears the plastic fails and they break off, especially when towing.	POLY	Satisfied	RIB BW	Yam50	Same
>>We installed plastic rings around the propellers mid-summer 2017. While the prop guards do slow the boats down over 8-10 knots, the benefit of increased safety outweighs the compromised speed.	POLY	Unsatisfied			Review other options
>>We didn't use prop guards - we tried them briefly years ago apparently- but would be interested in what other clubs did because we saw other club boats had prop guards.	NONE				Review other options
Guard Type Code					
AEG = Aegis brand propeller with rounded edges from Turning Point (https://turningpointpropellers.com)					
CAGE = Wire cage swimmer guard from Propeller Guard Technologies (http://www.propguardtech.com/swimguard.html)					
JET = Jet pump engine (Yamaha unit is typical https://yamahaoutboards.com/en-us/home/outboards/jet-drive-high-thrust)					
POLY = Polypropylene concentric ring from Prop Guard Marine Inc (http://propguardmarine.com)					
STEEL-A = Stainless steel band from Adventure Marine Manufacturing (https://adventuremarine.ca/product/propeller-line-guard)					
STEEL-P = Stainless steel band from Prop Savers Inc. (http://propsavers.com/troll-prop-saver)					
UNK = unknown type of guard was installed					
No Update = actual usage during 2018 not yet reported					
NONE = no guards installed during 2018					